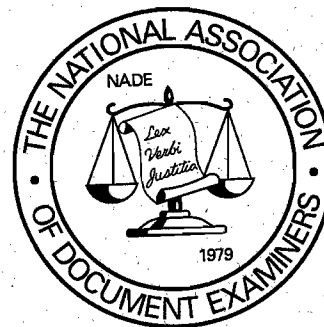


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EDITORIAL BOARD

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Editorial

Correcting Errors in the New Era

Have you ever found yourself starting letters with an apology? "Sorry I have not written in a while, but I have been very busy..." Well, as chief editor, I need to begin the first editorial of the new era with an apology. Several apologies, actually.

In the last issue, three errors fell through the cracks and appeared on the cover and in the Table of Contents. We apologize to Marcel Matley for the incorrect placement of the letters "CDE" after his name. This happened at the editorial level and we regret any confusion this may have caused. We also apologize to Mr. Herbert R. Fineburg, Esq. for the omission of the "Esq." and to Mr. Robert Johnston for the omission of the "t" in his surname.

All of these errors are fairly easy to understand as oversights, and you can be sure that we will be proof-reading with even more diligent eyes so that we have as few of these types of errors as humanly possible.

There is one more error that goes beyond the "oversight" category. In my article entitled *Ink Differentiation Using a Digital Camera*,¹ published in the Spring, 1999 issue, I made a serious error in explaining the theory behind some of the results.

Despite much reading on the subject and two peer reviews of the article in addition to editorial review, I failed to correctly understand or explain the concept of filtration of infrared reflection/absorption. It was a subsequent reading of Ordway Hilton's book, *Detecting and Deciphering Erased Pencil Writing*² that first brought the error to my attention, and it took several conversations with Mr. Bill Koppenhaver and Mr. Dick McEvoy for me to fully understand why things were not as I has thought. In a different situation, I might just apologize and move on, but this technical subject matter is not easy to understand, and it does everyone a disservice to leave an erroneous explanation in place. The original purpose of the article was to offer my colleagues a new tool to use in document examination, but with a flawed explanation, what I have done is to leave anyone who uses the article as a basis for testimony open to attack on cross-examination. Therefore, I am printing an updated copy of the article in this issue correcting the earlier misstatements.

Having dispensed with the errors, we can now get to the issue at hand - the first issue of 2000. As we had hoped, several articles were prompted by presentations at the annual conference in Orlando. The articles on Ink, Demonstrative Evidence, and Configuration are all expansions of the excellent talks given by their authors. You will also find a cluster of articles on legal issues and an article covering a new technology that may have more significance for us than it would seem at first glance. Case Notes and Forensically Speaking round out this issue.

Emily Will,
Chief Editor

1. Will, Emily J., M.A., CDE, *Ink Differentiation Using a Digital Camera*, Journal of the National Association of Document Examiners, Inc., Spring 1999, Volume 22, No. 1. Pgs. 26-28
2. Hilton, Ordway, M.A., *Detecting and Deciphering Erased Pencil Writing*, Charles C. Thomas, Publisher, Springfield, IL, Pgs. 44-49

IDENTIFICATION OF DELINEATION OF FORM WRITING: THREE CASE STUDIES

by

Larry S. Miller, Ph.D.

Questioned document examiners are often called upon to examine handwriting, handprinting, machine impressions, ink and paper. They may also be called upon to examine drawings, caricatures and even doodles in an attempt to identify the "author" of such drawings.

Recent research into the area of identifying human figure drawings using questioned document examination techniques indicates that this is a valid method of determining the "author" of such drawings (Miller, 1995). Drawing pictures and doodling, referred to as delineation of form writing, are perceptual and psycho-motor skills using the same functions as handwriting (Nihei, 1983; Stelmach, 1984; Huntsinger, 1994; Malloy-Miller, 1995; van Galen, 1998).

This paper presents three actual case studies where anonymous drawings were identified using the same questioned document examination techniques currently taught and used for handwriting identification.

Case Study 1: The Victim of Sex Abuse

In November 1994, an elementary school teacher found a wadded up piece of notebook paper lying near the trash can in her classroom. As she picked up the paper to throw it into the trash can, she notice the words "I Love Sex" written on the paper. Opening the paper, she discovered a cartoon depicting a male and a female, complete with genitalia (see Figure 1 A). The teacher showed the cartoon to the school counselor who informed her that, from the way the characters were drawn (i.e., no arms on the bodies and separate drawings of female genitalia), the child "artist" might be a sex abuse victim. The teacher and the counselor decided that they should investigate further to try to determine who drew the picture.

The following day, the teacher asked each of her 22 students (aged 7-9 years) to draw a cartoon of his or her family as a classroom "exercise." The teacher also called the state department of human services, child protective services to report her suspicions. Child protective services workers collected the questioned drawing along with the 22 family drawings made by the students and submitted them to our laboratory for examination. Of the 22 drawings one clearly stood out as being most like the questioned drawings (see Figure 1 B). Using standard questioned document

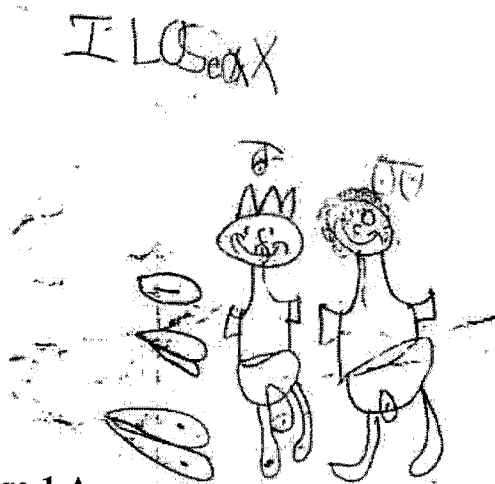


Figure 1 A

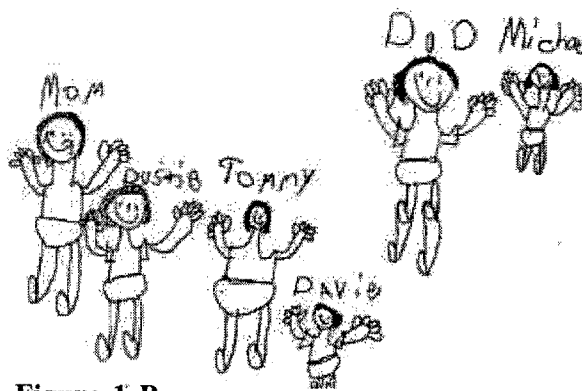


Figure 1 B

examination techniques, the "author" of the questioned drawing was determined to be an eight year old female in the class. The similarities found between the two drawings included line quality (skill of the "artist"), proportional spacings (torso, legs, arms, and head sizing in relation to each other), circle and loop formations, and rectangular formations.

Child protective services workers interviewed the 8 year old child at her school, and the child admitted drawing the picture. The child also disclosed that she had been the victim of father-daughter incest with her stepfather for nearly a year. The father was arrested and confessed to aggravated child rape. He is now serving a sentence in the state penitentiary.

Case Study 2: Bomb Threat

In February 1998, a note was found in a boys' restroom at a high school. The note indicated a bomb was planted in the school (see Figure 2 A). The student who found the note immediately presented it to the Assistant Principal who ordered the school evacuated. Sheriff's officers responded along with a "bomb dog" to help search the school grounds. A pipe bomb was found under a table in the cafeteria section of the school.

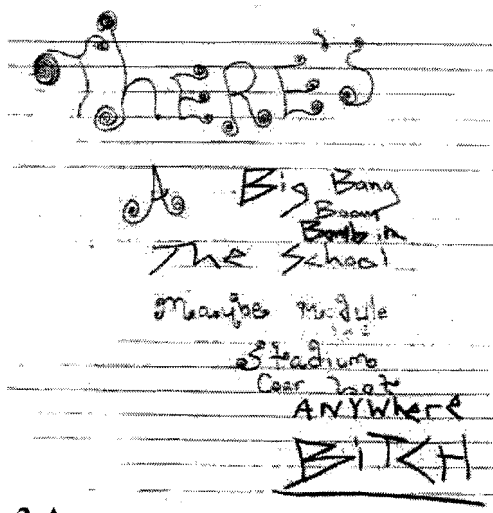


Figure 2 A

While the pipe bomb contained a commercially available "black powder," known as Pyrodex, the fuse was ill-formed, and it was doubtful the bomb would have exploded. Sheriff's investigators took on the task of interviewing students, faculty and staff within the school. They collected numerous student school papers and notebooks in an effort to compare the bomb threat note with these handwritten items. They submitted the note along with specimens of handwriting to our laboratory.

The questioned bomb threat note was obviously disguised, having been executed using varying styles of writing along with circular embellishments on the letters. None of the specimens of student handwriting submitted could be compared with the bomb threat note. However, in one notebook submitted for comparison, the student had doodled drug paraphernalia and circular designs in the lower left-hand corner of the notebook paper (see Figure 2 B). While there were no drawings on the bomb threat note, the circular embellishments on the letters were consistent with circular formations appearing in the lower-left hand corner of the student's notebook. Although an identification could not be made on this one characteristic, it was sufficient for investigators to question the student.

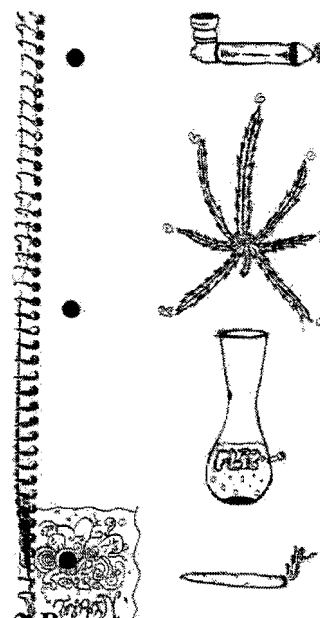
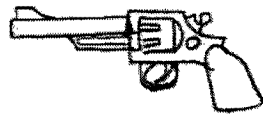


Figure 2 B

Investigators went to the home of the 16 year old male student and, before they could begin their questioning, the student admitted to placing the pipe bomb in the cafeteria. When investigators searched the boy's room they found drug paraphernalia, marijuana, a book on bombs, Pyrodex powder and a muzzle-loading rifle.

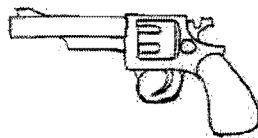
Case Study 3: The Gun Fanatic

In April 1998, a high school principal received a drawing of a pistol along with the caption "Bang! You'r Dead!" (see Figure 3 A). Dismissing the cartoon as a sick joke, the principal put the cartoon in his desk drawer and forgot about it. A week later, a teacher found another cartoon lying on her classroom desk. The cartoon depicted guns along with the caption "Everyone in Pod 2 will Die!" (see Figure 3 B). The teacher brought the cartoon to the attention of the principal who compared it with the one in his desk. Noting the similarities between the two cartoons, he became concerned that the student drawing the cartoons might be serious. The principal's concerns were magnified based on recent incidents of school violence involving students bringing guns to school and shooting other students and faculty. The principal called in the police to investigate.



BANG!
YOU'R DEAD!

Figure 3 A



EVERYONE IN POD 2
WILL DIE!



Figure 3 B

Police investigators noticed one thing in particular about the two cartoons. Both drawings of the guns were remarkably accurate. The "artist" obviously knew something about guns and how they worked. Both of the cartoons depicted a revolver, complete with ejector rod housing and cylinder release button. One of the cartoons also depicted what was obviously a Thompson sub-machine gun. The drawings were in such detail that police investigators were concerned that the "artist" might be serious in his/her threats.

After questioning students, faculty and staff at the high school, investigators narrowed a list of suspects to 12 students who enjoyed hunting and firearms target practice. Investigators attempted to collect handwriting specimens of these 12 students from files within the school. One student locker contained a notebook with doodles and drawings, some of which were firearms (see Figure 3 C). When the student, a 14 year old freshman, was asked about the drawings, he denied drawing the threatening notes.

Officers submitted the two threatening notes and specimens of the student's handwriting and drawings to our laboratory. On one of the student's specimen doodles, two revolvers and a sub-ma-

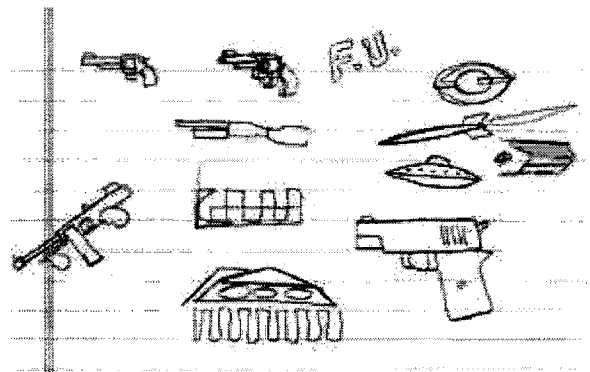


Figure 3 C

chine gun were depicted which matched those on the threatening notes. Armed with our laboratory findings, police were able to obtain a Juvenile Court Attachment for the student along with a search warrant for the boy's home. On searching the home, officers found a large collection of firearms belonging to the boy's father. The father, a Class 3 Federal Firearms licensed dealer, had among his collection a Thompson sub-machine-gun and numerous Smith & Wesson revolvers much like those depicted in the student's drawings and threatening notes. Under further questioning, the boy admitted to writing the notes and drawing the images on the threatening notes.

Conclusion

Previous research has indicated that doodles and drawings of human figures can be identified through traditional questioned document examination techniques (Miller, 1995). While one of the above cases involves the drawing of human figures, the other two involve the drawings of inanimate objects and simple doodling. No research has been attempted to extend the identification of human figure drawings to inanimate objects. However, the latter two case studies lend validity to this ability.

What is known is that drawings that are to be compared must be of the same objects or similar formations. As with traditional questioned document examination, comparisons must be made between the same or similar characters. What is also known is that those people who draw threatening cartoons are more likely to enjoy drawing cartoons or doodling, to be somewhat skilled at drawing, and to have such drawings in their possession for comparative analysis.

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THE CONFIGURATION PRINCIPLE IN SIGNATURE AUTHENTICATION

by

Willa W. Smith, EdD, CDE

Abstract: Signatures show a constant and individual style. The configuration of a signature is its gestalt, or integration of proportions that make up the unique individual signature. If one changes part of the signature, other parts change as well, so that the basic elements and proportions may remain stable. Two examples are given to illustrate how the configuration principle is useful to the document examiner, especially when dealing with illegible signatures.

Gordon Allport and Philip Vernon, along with Robert Saudek, Werner Wolff, Klara Roman and others, were experimenting in the late 1920s and early '30s on the problem of individuality and constancy of expressive movement. Allport and Vernon summed up their experiments with:

From our results it appears that a man's gesture and handwriting both reflect an essentially stable and constant individual style. His expressive activities seem not to be dissociated and unrelated to one another, but rather to be organized and well-patterned. (1)

Expressive activities here refer to walking, talking, hand gestures, writing, drawing, - motor skills in which people develop their own unique and consistent style.

Individuality and constancy, or consistency, are important to document examiners in authenticating signatures. The signature is our most individual and expressive graphic gesture. Valued as our "mark," a signature stands for one person only.

Wolff (2) says there are inner and outer limitations that modify our natural movement. For example, an outer limitation would be the amount of space we are

given, and an inner one is the amount of energy we invest in the movement. If either the inner or outer world causes us to change part of the signature, we will change other parts as well so that the basic proportions and elements remain stable. Wolff likens this process to that of a musician transposing a piece into another key. Although the piece sounds different, the rhythm and proportions (the *gestalt*) remain the same.

This gestalt, or integration of proportions into a unity, is called *configuration*. We each have our own special configuration of body, our individual appearance, and a special configuration of mind (*psycho-soma*). And we all have a tendency to maintain the stability of our configuration in response to any disturbance to its normal condition. Psychologists call this tendency toward balance *homeostasis*. The stability, or consistency, of general configuration has been found to exist even in infants and primitive peoples.

Most graphic patterns are a mixture of two principles of balance: (1) through repetition, and (2) through interrelationships. Repetition can also be called rhythm. Within rhythm, there are two basic movements in the repeated pattern: those toward the writer (*centripetal*) and those away from the writer (*centrifugal*). The meaning of these terms is related to the meaning in the physical sciences, that is, centripetal motion going toward the center (the writer), and centrifugal motion fleeing from the center. These movements can also be called impression and expression, breathing in and breathing out, contracting and expanding.

Figure 1 (Robert Garver) presents a group of signatures where in all cases the centripetal movements are consistent and can be counted. Here there are six centripetal movements in the first name, and five in the last name. The technique of finding and reporting patterns of rhythm is important especially in signatures that have few or no letter forms or proportional relationships. Beryl Gilbertson, a Canadian researcher, points out, "Where precise rhythm does exist, it can carry strong evidential weight." (3)

Interrelationships within a signature are the mathematical ratios uncovered among lengths of units between

Q1 MORTGAGE



ROBERT L. GARVER, SR.

K4 MOTION TO STRIKE



Figure 1

dots and touchpoints, and radii of curves. Wolff found many interrelationships, or integrations of proportions, in the signatures he studied. He looked at relative position and lengths of t-bars, flourishes, dots, curves, etc.

Figure 2 (Carl Sande) illustrates two kinds of unifying configurations. One is the slant of the second downstroke of the middle-initial "E" causing a similar angle (37° or 39°) at the intersection of its extension and the line drawn between the high points of the signature. Another is found by measuring the radius of each arc in curves of both first and last names. The centripetal arc's radius in the first name matches the

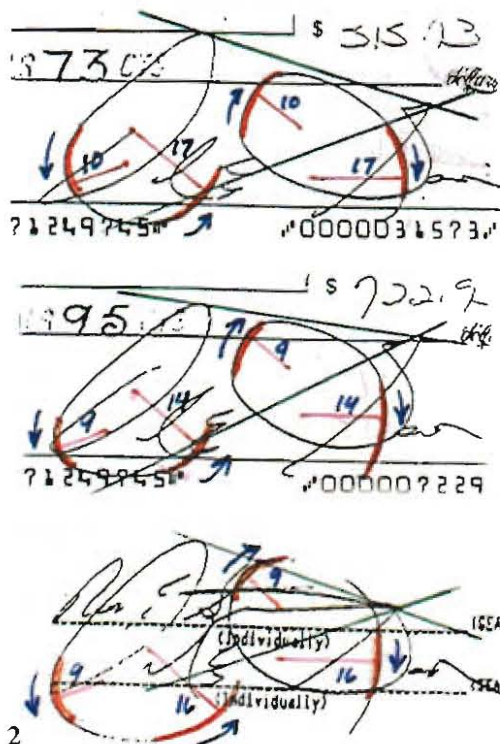


Figure 2

centrifugal arc's radius in the last name (10mm in one signature, 9mm in two signatures). The centrifugal arc's radius in the first name matches the centripetal arc's radius in the last name (17mm, 14mm, and 16mm in the three signatures respectively). In all cases the arcs are measured at the same locations.

Wolff calls the signature a "flash performance" of individuality. Since no one can consciously, intentionally, imitate the rhythm or the mathematical relationships found in some signatures, the configuration principle can be helpful to document examiners to prove or deny authenticity. However, there is a limitation to this method: Although this principle is potentially present, we cannot expect it to always be there. Although Wolff found many cases of consistency, not all signatures will demonstrate configurations useful to the document examiner.

The configuration principle is merely another to consider in our investigations.

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- (3) Gilbertson, B. "Rhythm in Handwriting," *Journal of the National Association of Document Examiners*, Vol 22/2 Summer, 1999

Willa Smith, CDE, has a doctorate in Educational Psychology from the University of Massachusetts, where her research revealed connections between handwriting and creativity. A former teacher, she has lectured and written articles on handwriting analysis, document examination, research, and language usage. Ms. Smith has served as proof editor for the *Forensic Examiner* (ABFA), and as co-editor of the *Human Graphics Center* newsletter and the *NADE Journal*. Recently she testified in court as an expert in language and grammar. She was certified by NADE in 1992.

INK DATING EXAMINATIONS

by

Erich Speckin, B.Sc.

In the field of Forensic Chemistry, advances in technology have made it possible to date ink within six months or less until it is approximately 3 to 4 years old. The dating of ink is done in three primary forms:

The first form is chemical date tagging. Approximately one-third of all inks manufactured in North America from the late 1960s until 1994 contained a compound unique for the year of manufacture. An ink chemist can determine which of these chemical date tags, if any, are present in an ink and then consult a reference database to determine the year of production.

The second form of ink dating is by the "first date of production." The earliest possible production date can be established by determining the type and manufacturer of the ink. This is primarily for older questioned documents, such as the "Hitler Diaries".

The third form of ink dating is by the dryness of the ink. Once ink is placed on paper it takes three to four years for it to dry completely. If an ink is completely dry, it has been on the paper for more than three to four years. If it is partially dry, the age of the document often can be determined within six months. The newer the ink, the more accurately the date can be determined.

There are three methods to determine the "dryness" of the ink. They are known as rate of extraction, percent extraction, and dye ratio (the ratios among the dye components of the ink). These tests measure how fast and how easily questioned ink can be chemically removed from paper. The ink chemist then compares these rates and ratios to those of known dated samples from an extensive library of known inks of various ages.

These chemical tests, which will determine when an ink was placed on a document, have been particularly useful in assessing the timing of entries in medical records, billing documents, wills, corporate minute books, individual notes and diaries.

Has a record been tampered with?

Many cases that come into the ink laboratory are related to suspected alterations or fabrications of records and journal entries. Some signs to look for that may indicate "record tampering" are:

- crowded entries;
- entries compressed around other entries;
- entries made in the margins or along the bottom of a page;
- uniformity of handwriting;
- relative length of questioned entries compared to other entries in the chart;
- unnatural spacing between entries;
- entries that shift the blame onto a patient or client, such as "Pt. refused" or "non-compliant";
- differences between what the case narrative indicates and what the records indicate; and
- strange notations such as "complained of NO chest pains".

The preferred practice is to have the document in the ink chemistry laboratory for the ink dating examination; however, if samples are needed and the document cannot be shipped, Speckin Forensic Laboratories makes these options available to the client:

- A. A chemist can travel to the documents to take the samples. While this method can become expensive, the advantages are that the chain of evidence is constant and that the chemist can examine the document in its entirety to look for heating, contamination, and other indicators of attempts to simulate aging of the ink.

- B An evidence technician from the laboratory can travel to take the samples. This is a person who is trained in ink dating and who can examine the document for the same items listed above, but at a lower cost.
- C. A document examiner from the area where the document is located can take the samples with equipment supplied by the ink laboratory. This person would be needed to testify as to the chain of custody.

However the samples are to be obtained, the ink chemist needs some background information before any samples are taken. This information would include:

1. Copies of the document in question.
2. Identification of the colors and types of inks (ballpoint or non-ballpoint).
3. List of other documents that were kept with this document at or near the same time.
4. In some cases, results of examination with an infrared image converter to determine whether some inks have the potential to be the same as the questioned ink according to their infrared reflection and absorption properties.
5. The type of paper used for the questioned document and which documents in the same file are of similar type paper.
6. Whether any text is written on the reverse side of the questioned document or entry.

Based on this information the ink chemist will determine the number of "plugs" (samples), the manner in which the plugs should be taken, and the location from which the plugs should be taken. The location is always selected with an eye to-

wards causing the least disturbance to any handwriting or other document evidence that may be present. The vials containing the plugs will be labeled and returned to the laboratory along with a worksheet that details the contents of each vial. The number of plugs, the document and the location on the document, the color of the ink, and the type of ink will all be listed on the worksheet by the person taking the samples.

The length of time required for the actual analysis ranges and depends primarily on the backlog of the laboratory system at the time of submission. Typically the turn around time is ten to fifteen working days, but the work can be done as fast as one to two days if there is a drop-dead deadline.

Erich J. Speckin is a partner at Speckin Forensic Laboratories in Okemos, Michigan. He has a degree in Chemistry from Michigan State University and deals primarily with the dating of documents and the dating of inks. Approximately 600 cases per run are done in Speckin Forensic Laboratories, with much of the work dealing with some form of document dating or ink dating. The firm is a full-service forensic firm that deals with all aspects of forensics including DNA, fingerprints, document examination, computer data recovery, and audio tape analysis. The laboratory also houses a VSC 2000, which can be rented for use by any document examiner if requested.

For further information, including case studies, please email especkin@4N6.com, or view the website at www.4N6.com.

INK DIFFERENTIATION USING A DIGITAL CAMERA

by

Emily J. Will, CDE

Document examiners are often presented with the question, "Was the writing executed with more than one writing instrument?" This often means, "Is all the ink the same?" The question usually is asked because to the naked eye, the ink does appear to be uniform. It may appear to be black or close shades of blue.

One traditional approach to answering this question has been through infrared photography with a 35mm camera. A special infrared (IR) sensitive film is used under carefully controlled conditions. With the unaided eye it is not possible to see in advance what the results might be, but after the film is processed, if different inks were present on the document and if they reacted differently to IR excitation, then these different reactions might be recorded on the film. With the arrival of digital cameras there is an easier way to approach this problem.

IR Differentiation of inks can be achieved using filters and some digital cameras. This article explains the process and gives examples. Please note that this article refers to the Sony Digital Mavica series of cameras because this is the camera that the author has found to be most suitable. There may be other digital cameras that would do as well, or even better.

Inks which look the same upon visual examination may be revealed as different by their different reactions to IR radiation.⁽¹⁾ The IR is a band of the electromagnetic spectrum just above visible light (See Figure 1). IR rays have longer wavelengths than visible rays. Wavelengths in the electromagnetic spectrum are measured in *nanometers* (millionths of a millimeter) or *angstroms*

(ten-millionths of a millimeter). Humans are more likely to feel infrared as heat than to see it as light.⁽²⁾

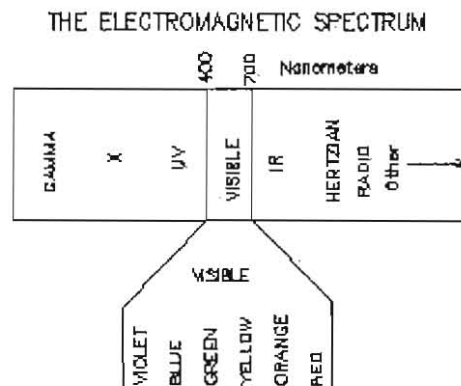


Figure 1

The band of light that humans can see is just a small part of the electromagnetic spectrum.

There are electronic viewing devices that can make IR waves visible to the human eye. With such a device, two inks that appear to be the same to the unaided eye can be seen to be different if they react differently to excitation by IR radiation.⁽³⁾

The Sony Digital Mavica FD-7 camera is such a device. When a light with IR content (a typical quartz-halogen lamp or inexpensive tungsten light bulb will do) is focused on a questioned document, the light (including the infrared content) will either be absorbed or reflected to varying degrees. As more is absorbed, less is reflected, and vice-versa.

A Kodak Wratten IR filter allows only IR and longer wavelengths to pass through. The Sony digital camera is sensitive to IR. It allows the examiner to see into the selected IR region and to photograph it. Kodak Wratten filters were at one time available at five different transmission ratings. Today only three of these filters are still manufactured by Kodak. (See Figure 2) Other companies, such as Tiffen, also have made IR filters.

Kodak Filter #	Nm
89B (current)	690
88A (disc.)	720
87 (current)	740
87C (current)	790
87B (disc.)	820

Figure 2

Each filter allows waves at only its rating or longer to pass through. Let us consider a situation in which two black inks are present on a white paper. Ink A absorbs a high proportion of IR, while Ink B reflects a high proportion of IR. Viewing the document with the Sony camera and using the Wratten 89B filter rated at 690 nm, Ink A looks darker than Ink B. Ink A, which absorbs more IR than does the paper, blocks the IR that would normally reflect from the paper, creating a dark area on the viewer. We see Ink B only faintly, because Ink B reflects IR at about the same rate as the paper. Since Ink B and the paper are reflecting almost equally, there is little to allow visual discrimination between the ink and the paper, and the ink appears to fade against the background of the paper.

The ink could also be transparent to IR. This would allow the reflection of IR from the paper beneath the ink to show.

This is shown in Figures 3a and 3b.



Fig. 3a



Fig. 3b

On the left are Inks A and B photographed without filtering. On the right, the 690nm filter is in front of the camera lens. What the examiner sees as "Ink A" is actually an absence of reflection. Ink B, on the other hand, reflects IR at a rate closer to that of the paper (or is transparent to IR) and is therefore less visible.

This technique has been used by the author in the examination of questioned documents. In one case, the writer of a journal asserted that the writing in each of two questioned entries was executed in one writing session. The question asked was, "Are there any indications that more than one pen was used to prepare each questioned entry?" To the eye, even under magnification, the inks looked identically black, and no clear differences could be discerned.

Each of the questioned entries was examined and photographed using the Sony digital camera with and without the Wratten filters in front of the camera. One of the questioned entries did not show clear differences in reaction to infrared. It is possible that with different filters or different techniques, some reactions could have been documented. It is important to note that failure to observe differences using this technique does not in itself constitute proof that there are no differences.

However, one of the questioned entries did show documentable differences. In this instance inks that appeared to be the same even when viewed through the Wratten 89B (690nm) filter, were then differentiated when viewed through the Wratten 87 (740nm). With the Wratten 87 filter, one section of writing "disappeared." Figures 4a and 4b show the unfiltered and filtered view of portions of the questioned entry.

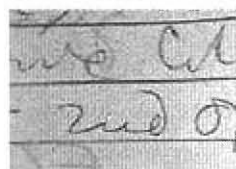


Fig. 4a



Fig. 4b

Fig. 4a is the unfiltered view. Fig. 4b is the view using a Wratten 87 filter. The ink visible in 4b absorbed more IR relative to the paper than the ink that has "disappeared."

The fact that one ink can be seen through the Wratten 89B, but not through the 87 tells us that it absorbs IR wavelengths, equal to or longer than 690nm, but does not absorb those wavelengths that are 740 nm and longer. If those longer wavelengths had also been absorbed instead of reflected, we would have been able to see the dark area where the reflection of IR by the paper would have been blocked by the absorption of IR by the ink, even with the 87 filter. The other ink can be seen through both filters and therefore absorbs wavelengths 740 nm in length or longer. It should be noted that the author did not have a 720 nm(Wratten 88A) filter at the time of this examination.

IR absorption and reflection are not the only properties that can be studied in this manner. Inks can also be luminescent. There are two types of luminescence - fluorescence and phosphorescence. Ink is more likely to exhibit fluorescence. Some inks, when excited with a specific wavelength of energy, will cause a shift to a different reflected wavelength. This shifted reflection is fluorescence. Some materials continue to reflect even after the exciting source is removed. That type of luminescence is known as phosphorescence.⁽⁴⁾ The setup for this work is complex, requiring a range of excitation wavelengths as well as a range of camera filtering. The digital still-camera may prove to be a useful tool in such a setup.

The digital camera is a new and valuable tool for the document examiner. With the right camera, a good light source and an assortment of IR filters the document examiner can often discriminate between inks that appear to be identical.

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DEMONSTRATIVE EVIDENCE

by

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ABSTRACT

Demonstrative evidence consists of all exhibits used to support an expert witness' testimony. This paper covers types of exhibits that a document examiner can use in the courtroom and the considerations for determining what type is appropriate. The discussion includes photocopies, photographs and scanned documents.

Key words: exhibits, comparison charts, jury books, presentation of evidence, photocopies, photographs

INTRODUCTION

Demonstrative evidence consists of exhibits that support an expert's opinion. Properly designed, they graphically portray the reasons for the expert's opinion. Models, diagrams, charts, photographs, videos, maps, transparencies and slides can be used as demonstrative evidence.

Studies show that jurors retain facts longer, maintain attention and understand information better when it is presented both verbally and visually. Properly formulated visual exhibits are among the materials most easily understood and best remembered by jurors.

Exhibits should be designed to inform, to educate, to persuade and to support a witness' testimony. They should focus attention on critical issues of the case and assist the trier-of-fact in understanding the evidence. The trier-of-fact must be able to interpret the evidence and come to the same conclusion the document examiner has reached.

Most handwriting cases can benefit from demonstrative evidence. *Bradford and Bradford* wrote in *The Introduction to Handwriting Examination and Identification*, "Virtually all document examiners agree that cases in court should not be proved with words alone, but by demonstrations with exhibits." (p. 444) Ordway Hilton said in *The Scientific Examination of Questioned Documents*, "Virtually every document case should be illustrated to make the testimony clearer and more effective." (p. 391) Albert Osborn stated in *Questioned Documents*, "Appropriate illustrations enable court and jury to see for themselves and understand that upon which a judgment must be based." (p. 637)

The reason for an expert's opinions should be given and demonstrated. Most testimony can be enhanced by visual aids. What should be demonstrated? 1) Information that is complex, 2) important points that need to be emphasized, and 3) side by side comparisons can be demonstrated.

CONSIDERATIONS

The expert must first consider what evidence would benefit from an exhibit. What points are to be emphasized in the expert's testimony and how are these points to be demonstrated? For questioned and known signatures it is best to use comparison charts. To emphasize a small detail, enlargements are recommended. Some evidence benefits from a demonstration in court.

The examiner should first determine what the visual aids will demonstrate, and then determine the proper media to illustrate the findings. Visual aids cover everything from impromptu blackboard drawings to complex videotaped evidence. Most exhibits fall somewhere in between.

The courtroom environment is a primary consideration. The trier-of-fact, whether judge or jury, must be considered, and the effectiveness of various types of visual aids must be taken into ac-

count. The degree of enlargement is another important factor to take into consideration.

What is the layout of the courtroom? Is it a modern courtroom geared to modern equipment or an older model that does not handle modern apparatus well? Many older court houses have beautiful rooms with high ceilings and huge windows from ceiling to floor that cannot be darkened to accommodate slides and overheads. Some court-houses have a variety of styles of rooms, and it may not be possible to know in advance where testimony will take place.

Who will be the trier-of-fact? Will the judge determine the facts of the case, or will the facts be decided by a jury? If there is going to be a jury, how many people will be on the jury? How many alternates are there? Many jurisdictions have reduced the number of jurors from twelve to six. Generally there are two or three alternates, but in some cases there may be more.

And finally, based upon the type of case being presented, what is the best method of highlighting the evidence? Modern equipment enables the witness to use many different methods of preparing and presenting exhibits.

REQUIREMENTS

Exhibits must be generated by the expert, or under the expert's supervision. The name of the expert or the person who prepared the exhibits should be affixed to the exhibit. Exhibits should enhance the expert's verbal testimony and the important points that are to be emphasized.

The judge will rule on the admissibility of exhibits. The exhibits must be relevant and material to the case, that is, they must have a connection to the case and they must be significant. They must assist the trier-of-fact in understanding the document examiner's testimony.

ENHANCEMENTS

Materials used for exhibits generally benefit from enlargement so that details can be clearly seen. The degree of enlargement may vary depending upon the characteristics being featured. A 200% enlargement works well on full signatures. Demonstrating the sequence of writing or illustrating a small detail usually requires 500% to 1000% enlargement.

The exhibits should tell a story. Anyone should be able to look at the exhibit and understand its message. Material must be clearly marked and identified. "Questioned" and "Known" should be placed above the entries on the exhibit, and documents should be identified by their designation such as Q-1 or K-1. Label material so the source can be easily located. Exhibits of letters from within words should state the word from which they came as well as the page and the line where the word can be found. See Figure 1.

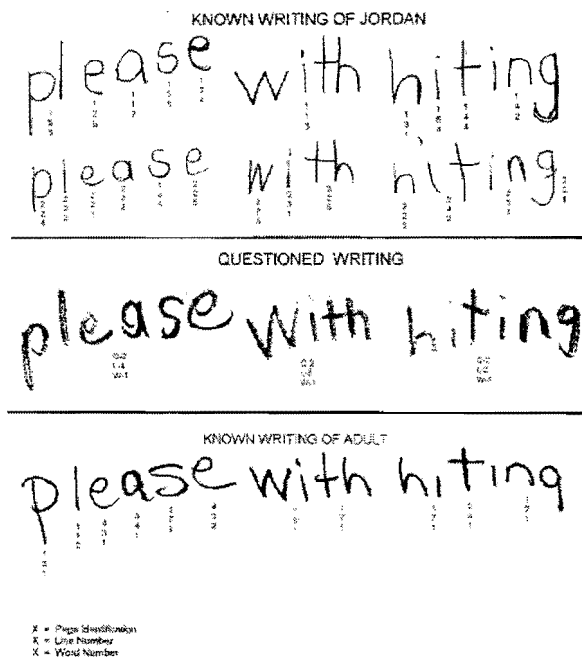


Figure 1

Exhibits should be simple, clear and convincing and should demonstrate one idea at a time. An overcrowded exhibit can cause confusion instead of clarification.

Arrows can be placed at strategic locations to point out a feature of the handwriting. Arrows can be drawn, stamped or computer-generated. The method used should always give professional results.

TYPES OF EXHIBITS

Traditionally, document examiners made enlarged photographs and mounted them on cardboard. This exhibit was placed on an easel in front of the jury. With luck, the members of the jury sitting closest to the exhibit might be able to see the handwriting characteristics that the examiner has illustrated. The jurors in the back row might be able to see the handwriting but they would not be able to see the subtle similarities or differences of importance in handwriting cases.

Fine details can be better demonstrated in enlarged photographs in jury books, which are notebooks that the jurors use to follow the expert's testimony. Overheads and slides can also show detail more clearly if the courtroom can be darkened.

Some cases lend themselves to courtroom demonstrations using a blackboard or closed-circuit television. These demonstrations should be reserved for important points that need to be emphasized. The expert should practice demonstrations prior to testifying.

PHOTOGRAPHS AND PHOTOCOPIES

The questioned document should be photographed and photocopied, as each has a different purpose in the preparation of exhibits. Photographs provide the most accurate record of the original document. They can be enlarged with less loss of de-

tail than photocopies. A one-to-one photocopy should be made of questioned documents to show actual size and as a reference for the photographs.

Photographs are more expensive than photocopies. Their chief advantage is that they reveal more details. Photographs should be large enough so that fine details are clearly seen. Very large photographs are costly, so several smaller ones may be more practical.

Photographs should cover only a small portion of the document. The physical size of a 35 mm film limits the amount of detail a photograph will show. If the area photographed is larger than the area of the film then fine detail will begin to be lost. If the entire 8-1/2" x 11" page is photographed, the resulting picture contains less detail than a good one-to-one photocopy.

A signature that is three inches long when photographed is reduced by about one half on the negative. This is about the largest area that can be photographed without too much loss of detail when the picture is enlarged to an eight-by-ten inch print.

As the area of the picture being taken becomes more nearly the same size as the film or smaller than the film, the greater becomes the amount of detail captured. An eight-by-ten enlargement from a one-to-one 35mm negative enlarges the material about 800%.

An image area roughly the size of a single character of 12 point type would be enlarged 5 times to fill a standard 35 mm negative. When this negative is then enlarged eight times to make an eight-by-ten inch print, the resulting picture is equivalent to viewing the letter under a forty power microscope or a 4000% enlargement.

If photographs are not taken properly, they can be poor exhibits. Fuzzy out-of-focus photographs are not acceptable. Improperly exposed

film can produce a photograph that is too dark or too light to see details. Photographs must be able to reflect the evidence clearly and accurately.

Photographs may be marked in advance with colored pens or arrows, or they may be covered with clear plastic mylar overlays that highlight important points. If photographs are to be marked, be sure to have unmarked copies available in case the judge disallows the marked photographs.

The simplest exhibit is a photocopy. Photocopies can be enlarged from 1% to 1000%. They are inexpensive and easy to obtain. Photocopies may lose detail when enlarged too much. Lines separate and begin to break apart leaving gaps. Photocopies are best when they do not have to be enlarged more than 400% to 500%.

Photocopies are becoming the first choice of many examiners for making exhibits. Care must be taken to accurately portray the evidence since photocopies can be easily distorted and altered. The biggest advantage of photocopies is that they can be produced more quickly and less expensively than photographs. They are especially useful for creating exhibits for comparison purposes.

Some problems cannot be illustrated with photocopies. For example, it is not possible to determine line sequence from photocopies. The direction of the writing line usually cannot be discerned from a photocopy. Subtle details may be lost when a copy is made from a copy. Line value is reduced and details are obscured on multi-generation photocopies.

It is important to work with the earliest generation photocopy available and to make copies from the earliest generation so that the evidence can be clearly demonstrated.

Sometimes it becomes necessary to remove extraneous material from a copy. White-out can be used, but care must be taken not to delete any

part of the relevant material. For example, when illustrating a signature that has obliterating lines, the lines need to be removed without removing any part of the signature. The courts will disallow exhibits that do not accurately reflect the evidence.

Color photocopies are easily obtained and may prove useful in some cases. When documents have different color background and/or ink, the colored copies help to identify the source documents.

Different color highlighters can be used to illustrate different points. It is best to underline the letter or words instead of covering the material with the highlighters.

Photocopies can be made from photographs. Photocopies made from enlarged photographs will show more detail than photocopies made from photocopies. See Figure 2.

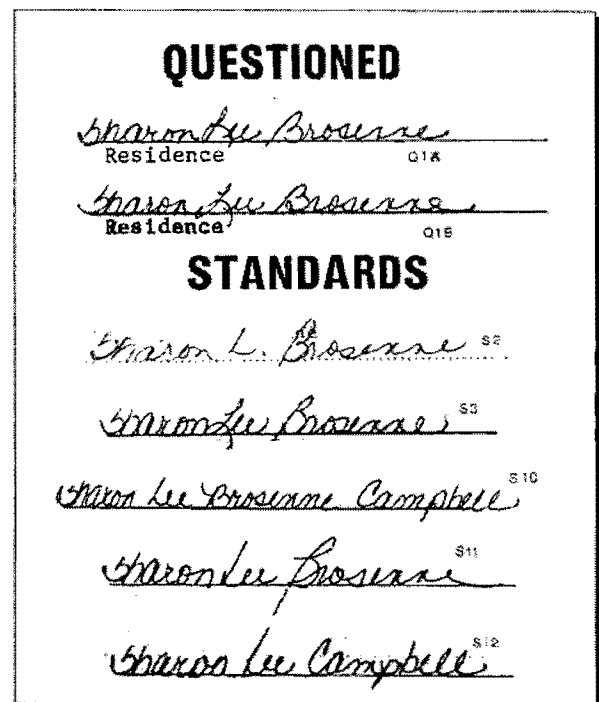


Figure 2

SCANNERS

An alternate method of creating exhibits is now available. Scanners attached to computers enable document examiners to scan their documents into their computers, enlarge them, rearrange them, label them and print them. This method is simple but time-consuming. Results are dramatic when the documents are printed on photography paper.

DIGITAL CAMERAS

Digital cameras that use electronic media instead of film are useful for producing exhibits. An image can be imported into your computer and placed into an exhibit and printed using photographic-quality paper. It is important to note that unless calibration software is used it is difficult to produce digital images at exactly the same percentage of enlargement, so that raw size comparisons may not be warranted with this method of demonstration.

COMPARISON CHARTS

Side-by-side comparison charts can be made from letters or words cut from photocopies or photographs. Mark one side of the paper QUESTIONED and the other side KNOWN. Sometimes a questioned signature is placed at the top of the page with the known signatures underneath. Explanations of the features illustrated can be added to the exhibits or listed on a separate sheet and attached to the exhibit. See Figure 3.

Some exhibits benefit from positioning the letters and words in the same arrangement as the questioned document. This is especially useful when the original material is misaligned. See Figure 4.

PRESENTATION OF EXHIBITS

Once the photographs or photocopies are selected as exhibits, it is then necessary to decide what

method is to be used to display the exhibits. Hand-held enlargements, transparencies for overhead projectors, slides, or large charts on easels may be prepared. There are advantages and disadvantages to each type of exhibit. Knowing the strengths and weaknesses of each type will enable the expert to make an informed choice and be better prepared to deal with the problems associated with each type of exhibit.


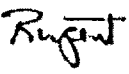













QUESTIONED	SUSPECT
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Figure 3

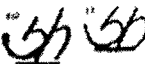


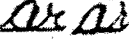
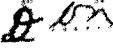
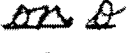

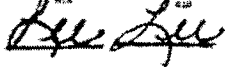



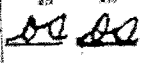
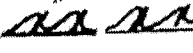


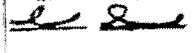
KNOWN	QUESTIONED
	
	
	
	
	
	
	
	

Figure 4

EXHIBIT BOOKS

Photographs and photocopies can be organized into booklets or portfolios. Portfolios that contain clear plastic pages for photographs or photocopies can be purchased from a stationery store. Portfolios come in six, twelve or thirty pages. If exhibit books are returned to the witness upon completion of testimony, they can be reconstructed for use in other cases.

Exhibits can be spiral-bound into a booklet when using photocopies. Copier services can provide spiral-binding for anyone who does not own a binding machine. A clear plastic cover and title page add a professional touch.

Various types of binders for reports are available from stationery stores. These binders come with heavy stock covers and have various methods of holding pages in place.

If the number of exhibits is very large, a loose-leaf binder can be used to hold exhibits. Dividers can be placed in the binders to make it easier to locate documents. There are generally pockets in these binders that can be used to hold transparencies or a small measuring device, if needed.

Pages in exhibit books should be numbered and a Table of Contents should be included to make it easy to locate each exhibit as needed. If a case involves many documents from several different sources, use of a different color for each source aids in easy identification. Questioned documents might be yellow, suspect samples might be blue and the victim's writing might be green. There should be one exhibit book for every one or two jurors, one for each attorney in the case, one for the court and one for the expert. If there is one exhibit book to every two jurors, they will have to share. This forces them to stay with the presentation instead of perusing the exhibit. The jurors may even point out features to each other.

The major disadvantage to hand-held exhibits is that the trier-of-fact may not be able to follow the witness. He may have difficulty finding his place. It is important that the witness make sure the jurors are looking at the proper page.

TRANSPARENCIES

Exhibits can be converted to transparencies. They can be distributed with handheld exhibits, or they can be used with an overhead projector. Transparencies are especially useful when demonstrating tracing or cut-and-paste. A laser pointer can be used to pinpoint important details.

SLIDES

Slides can be made from photographs or from a computer program such as "Presentations." Photographic slides can be arranged in a carousel in the order in which they will be discussed. Slides are colorful, and when properly used may enhance the expert's presentation. The principal disadvantage to slides is that the courtroom must be darkened to see them, and some courtrooms cannot be made dark enough.

CHARTS

Comparison charts or documents can be enlarged and mounted them on foamboard or tagboard. Size is limited by difficulty of handling large exhibits. Charts are usually placed on an easel near the jury and are frequently left there throughout the trial. The witness can point to important areas for the jury. The chief disadvantage is that all of the jurors may not be able to see the details from their seats.

DEMONSTRATIONS

Some situations benefit from demonstrations by the expert witness. The form of a letter can be emphasized by illustrating the letter on a blackboard or easel. A demonstration or technique

can be shown on a closed-circuit television with the jury watching a television screen while the expert shows the details from the witness box. Juries enjoy demonstrations that are straightforward and easy to understand.

The witness should not use a blackboard if a more permanent method of illustrating a characteristic can be found. Blackboards are erased and reused while a sheet of paper from an easel may accompany the jury into the jury room.

IN THE COURTROOM

Exhibits should either be easily transported, or delivered to the court prior to testifying. They can be kept in an adjacent room until needed or can be kept covered in the courtroom until time for use. An artist's portfolio can be used to carry and cover large exhibits.

It is important for the expert to maintain control of the exhibits at all times. They should be organized and marked for easy retrieval so as not to waste the court's time with a frantic search through exhibits. If possible, the exhibits should be arranged in the order in which they are to be presented. Jury books should contain a table of contents and numbered pages. All exhibits should be properly labeled for easy identification. Properly prepared exhibits will enhance the expert's testimony and keep it before the trier-of-fact after the expert has left the witness stand.

Equipment that is needed, such as an overhead projector, should be set up during a break. Familiarity with the assembly and operation of any equipment results in a smooth demonstration. Spare parts and an extension cord should be part of the equipment provided by the expert. Be prepared for emergencies. Remember Murphy's Law, "If anything can go wrong, it will." The judge may disallow the exhibits, and he or she may instruct or require testimony from the original document. Juries respond better to witnesses who leave the witness box and stand in front of them to testify.

After testifying, the evidence can be left on the witness stand or with the jury unless the judge instructs that it be removed. Most expert witnesses are excused upon completion of their testimony. Occasionally the client's attorney will want the expert to stay for rebuttal testimony.

A expert is testifying from the time he or she enters the courthouse. The impression one leaves with the trier-of-fact before, during, and after the testimony is important. Properly prepared exhibits will enhance the expert witness' testimony. Exhibits continue to testify for the witness after the witness completes his testimony and leaves the courtroom.

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SECURITY, HIGH TECH AND THE SMART PEN

by

Joe Lucas

High tech is all around us. It's computer this and computer that. Digitize, DVD, voice mail, e-mail, hot mail, faxes, cell phones, video phone. Will it never end? Apparently not.

With all this electronic influx there is a need for security measures. Some current security measures are holograms of various types, such as 2d/3d, dot matrix, laser and stereographic (a 4 second video clip on paper). There are inks such as thermo, laser, electronic, ovi, etc. that go beyond the realm of science fiction. As with modern inks, there are pens that fit into the security community. There are pens that supersede the mouse, and wand pens which require a mere touch of the pen to the computer screen and presto, all daily activities are recorded and ready for transfer to a disk. The wand pen also reads bar codes and eliminates the need for keyboards and keypads. Then there is paper manufactured solely for security, paper such as toner fusion, laser lock, touch safe, thermosafe, pantagram, nodupit, and paper that won't allow copying or scanning.

With all this "hi tech," the criminal has a whole new arena in which to work, and as he does, the need for security escalates. Along with hi tech defenses such as inks, iris checks, smart cards, pin numbers, fingerprints, palm prints, CVSA (computer voice stress analyzer) etc., there is a new kid on the block. It's called the smart pen, and it has catapulted handwriting into the hi tech spotlight. Smart pens are manufactured by both IBM and a company in the United Kingdom called LCI. IBM calls it the TSS (Transaction Security System). LCI calls it the Smart Pen.

There are two sensors in a smart pen that measure the wiggles you make when you sign your name. The wiggle tracking sensors resemble ceramic diving boards half an inch long, that wobble as the pen speeds up, slows down, or changes direction. In essence, movement is changed to digitized memory, or numbers. By tracking the wobble rate the pen's circuitry can track the motion of a signer's hand. A third sensor measures the varying pressure of pen tip on paper. The purpose of the pen is not to recognize the letters, but to identify the muscle movement that an individual uses in the writing process. It is interesting that scientists confirm the fact that each individual has a unique method of writing that cannot be duplicated by another. Smart pens, on occasion, will reject a genuine signature as well as accept a forgery, so other security features, such as smart cards, pin numbers, biometrics (iris checks) etc., are used as back-up systems in conjunction with the pen.

To initiate the personalization of the pen, and for security purposes, an individual writes several signatures with the smart pen. The pen has a computer chip that records the slant and pressure pattern. When the individual wants entry to a secure area he has to sign his name, and the pen will "determine" whether the writing is genuine.

As a safety feature, the pen makes allowances for acceptable changes in the writing. It does this by registering the last five writings compiling an average which it uses in comparison with the new signature. When the last writing is recorded, it eliminates the first sample taken and retains the last five for comparison.

Even though officials admit the pen cannot account for all the variables in handwriting, including false acceptances and false rejections, the manufacturers claim 97% accuracy. The cost? In the neighborhood of \$2000 and up.

One of the disadvantages of the pen is its size. The pen is big and cumbersome, slightly bigger than 5/8 inch in diameter. This size will hinder natural rhythm. Also, the writer must be mentally composed in order to pass muster, otherwise the pen will reject the individual. In addition, physical position of the writer is crucial.

As technology improves and the pen gets smaller and more affordable, there are practical applications in which the pen would excel, such as in law enforcement. What a great way to take exemplars. If used properly, disguised writing could be identified immediately. Combine the smart pen with CVSA and polygraph, and the results would be very useful. The downside is that no matter how hi tech or impressive, if the system or people responsible for verification do not know the parameters of the product, the system fails and the security is wasted.

One practical application is being demonstrated by a doctor in Finland who uses the pen to log onto his computer in order to write prescriptions, thus eliminating illegal entries.

The development of the smart pen has renewed an interest in handwriting. It further validates the value of graphic movement as an individual trait and, inadvertently, adds weight to the testimony of the handwriting expert.

J. Lucas has been involved in handwriting/document examination since 1983. He is a court qualified document examiner and a member of the National Association of Document Examiners and the American Society of Law Enforcement Trainers. He has taught handwriting identification/document examination at Kilgore College, Texas. He has had papers published in the National Graphological Quarterly. He is a Certified Statement Analyst and is approved in 28 states to instruct CID personnel in Handwriting Identification/Document Examination. He has been retained by the Minnesota Fraud Task Force, the New York State Department of Motor Vehicles, the Republican Committee on Voter Fraud and the North Carolina Criminal Justice Academy. He is also affiliated with VISA's Fraud Training Program.

THE MEDIATION AND ARBITRATION PROCESSES

by

Phyllis Cook, BCDE, Diplomate

Professional document examiners are often privy to the mediation and arbitration processes in the course of their work. Notice the plural "processes," because there is a big difference between the two even though at first one might think they are the same.

Mediation is the process whereby reconciliation of differences between conflicting parties of two or more disputants is brought about via a neutral intermediate agent or mechanism.

Arbitration is the process whereby reconciliation of differences between conflicting parties of two or more disputants is brought about via a neutral person or panel of persons with the power to make authoritative decisions.

The major difference between the two processes is that a mediator is not empowered to impose settlements or make binding decisions, whereas an arbitrator's decision can be both final and binding. In addition, the National Rules for the Resolution of Employment Disputes state that there shall be no stenographic record of the mediation process, whereas arrangements for a stenographic record can be requested and provided for the arbitration process. Why then, one may ask, do we bother with the mediation process? Mediation is a fair, voluntary way to facilitate disputes, claims or grievances between employees and employers, and it has been proven to work in significant numbers of cases not only in labor disputes, but also in commercial and technological disputes; therefore, it warrants attention.

In "Mediation: Questions & Answers" (see reference #2) the American Arbitration Association states:

National statistics indicate that 85% of commercial matters and 95% of personal injury matters end in written settlement agreements.

Two basic advantages of the arbitration procedure are the speed and finality of the resolution of disputes. Currently, discovery seems to be an issue in the arbitration process because it takes time and money, the two things that arbitration seeks to eliminate in order to expedite hearings. Right now it is the arbitrator's call, because due process rests in his/her authority to order discovery via depositions, interrogatories, etc.

There used to be no appeal under the arbitration process, but some states have held that disputants can provide for appellate rights in their agreements.

Both the mediation and arbitration processes are less formal than actual litigation involved in court trials. More leeway is given by the neutrals (impartial facilitators) to those who are testifying. (Usually more evidence is allowed on the record during the arbitration process because it is up to the arbitrator to deem what is necessary and relevant. Conformity to legal rules of evidence is not necessary.)

Expert witnesses are given more opportunities for making their cases. For example, it happened that in court a judge would not allow jury members to use the transparencies provided by a forensic document examiner saying that the jurors would be "playing" with them instead of listening. It would be most unlikely that this would happen during mediation or arbitration.

Do you understand the following sentence? The AAA in DRT said that ADR, NAA, CLE, NCDRC and EEOC would prepare conference themes for National Mediation Week for the ABA. If you don't, it is not surprising. What is surprising is that there are so many organizations and acts devoted to these processes. The following is a brief rundown:

AAA: The American Arbitration Association. This association established the National Labor/Management Arbitration Task Force in January 1999 to address issues facing employers and unions in the new millennium.

ADR: Alternate Dispute Resolution
Conducts educational training programs for mediators and arbitrators. (The goal of the Administrative Dispute Resolution Act of 1996 was to encourage federal agencies to resolve disputes using ADR.)

CBA: Collective Bargaining Agreement

CLE: Continuing Legal Education

EEOC: Equal Employment
Opportunity Commission

FAA: Federal Arbitration Act

IFCAI: International Federation of
Commercial Arbitration Institutions

NAA: National Academy of Arbitrators

NCDRC: National Construction Dispute
Resolution Committee

NCMA: National Contract
Management Association

UAA: Uniform Arbitration Act

Publications also abound in the field of arbitration:

ADR Currents (newsletter of Dispute Resolution Law and Practice)

Dispute Resolution Journal (covers the spectrum of ADR issues and techniques)

Dispute Resolution Times (A quarterly newspaper publication of the AAA)

Punch List (serving construction and related fields)

References:

1. American Arbitration Association Dispute Resolution Services Worldwide, *"Labor Arbitration Rules (Including Expedited Labor Arbitration Rules)"* c. 1996

2. American Arbitration Association Dispute Resolution Services Worldwide, *"Mediation: Questions & Answers"* c. 1998

3. American Arbitration Association Dispute Resolution Services Worldwide, *"National Rules for the Resolution of Employment Disputes (Including Mediation and Arbitration Rules)"* c. 1999

4. American Arbitration Association Dispute Resolution Services Worldwide, *"Resolving Y2K Technology Disputes - Fast Track Mediation and Arbitration Procedures"* c. 1999

5. ADR Currents, Vol. 4, No. 1, March 1999

6. ADR Currents, Vol. 4, No. 3, September 1999

7. Dispute Resolution Times, April 1999

Phyllis Cook is a court qualified, board certified forensic document examiner. As a teacher in the Philadelphia elementary schools, she became interested in handwriting while teaching children to write. In 1972, she left the teaching profession to start The Philascript Co., Inc., and in 1979 she co-founded NADE. She has lectured throughout the country, taught the subject on television, apprenticed students on the forensics of document examination, and authored numerous articles and several books. Although her sense of humor is known to most, she is deadly serious about her profession and the ethics of those who are experts in the field.

EXPERT NOTES**RUNNING HEADLONG
INTO RULE 26**

by

Jane Eakes, CDE

Abstract: Attorney A submitted documents for examination. A conflict of interest arose when Attorney B later requested services involving the same client and documents. When the examiner was later subpoenaed to testify only on the exemplars of Attorney B, the situation was compromising as to Rule 26 involving methods, scope and limits of obtaining discovery and trial preparation materials. This was duly noted by the judge who dismissed the testimony provided at the trial, thus protecting the examiner's work and professional integrity in the case.

**RULES OF CIVIL PROCEDURE... Rule
26...GENERAL PROVISIONS GOV-
ERNING DISCOVERY**

26.01.DISCOVERY METHODS. — Parties may obtain discovery by one or more of the following methods: depositions upon oral examination or written questions; written interrogatories; production of documents or things or permission to enter upon land or other property for inspection and other purposes; physical and mental examinations; and, requests for admission.

26.02. DISCOVERY SCOPE AND LIMITS. Unless otherwise limited by order of the court in accordance with these rules, the scope of discovery is as follows:

(3) TRIAL PREPARATION; MATERIALS. Subject to the provisions of subdivision (4) of this rule, a party may obtain discovery of documents and tangible things otherwise dis-

coverable under subdivision (1) of this rule and prepared in anticipation of litigation or for trial by or for another party or by or for that other party's representative (including an attorney, consultant, surety, indemnitor, insurer, or agent) only upon a showing that the party seeking discovery has substantial need of the materials in the preparation of the case and is unable without undue hardship to obtain the substantial equivalent of the materials by other means. In ordering discovery of such materials when the required showing has been made, the court shall protect against disclosure of the mental impressions, conclusions, opinions, or legal theories of an attorney or other representative of a party concerning the litigation of another party in anticipation of litigation or preparation for trial and who is not to be called as a witness at trial except as provided in Rule 35.02 or upon showing that the party seeking discovery cannot obtain facts or opinions on the same subject by other means.

Initial contact was made to the forensic handwriting examiner by Attorney A for professional services regarding examination of a handwritten "Note of Cancellation" and a signature written on the top of a faxed copy of an original Promissory Note. The amount of the promissory note was \$26,500.00 which was owed by his client. The client claimed to have a signed "Note of Cancellation" to cancel this debt. The conclusion was that findings were not favorable to Attorney A's client and he was advised of this over the telephone. He then requested a visit to the office to see the work product and obtain an explanation of how the decision had been made, and the examiner complied. It seemed to the examiner that Attorney A actually doubted his own client (the Defendant) all along, but was obliged to go on with the litigation.

At the time of Attorney A's visit, it was decided that the examiner would not be called to testify

but payment would be made for assistance in trial preparation only. This protected the work of the examiner against discovery by the Plaintiff.

A few days later a call came in from Attorney B requesting an examination on a case going to court the following week. When the documents were delivered to the examiner's office by courier that same day, it was noted that it involved the same case. A prompt call to Attorney B advised him of a conflict of interest, and that this examiner could not work on the case. Attorney B asked for a recommendation of someone else, and the name of the nearest examiner, who was located in a city 60 miles north of Nashville, was provided.

A call to Attorney A was then made, telling him about this incident. At that time Attorney A relayed that he had already informed Attorney B that he was not going to introduce this particular document in question at trial.

Two days later, the examiner was served with a subpoena from Attorney B to appear at trial and testify on the exemplars which had been sent previously by him to the examiner.

Attorney A then filed a Motion in Limine along with the affidavit of this examiner. Attorney B filed an answer to this motion, and it was argued before the Judge prior to convening the trial that same day. At 11:00 A.M. Attorney B called to say he had won the motion by arguing that this examiner was the only examiner of documents in Nashville and there was not time to go elsewhere. This examiner was ordered by the court to be present by 2:00 p.m. to testify on Attorney B's exemplars only, and there was to be no mention of anything that had been done previously for Attorney A.

The examiner complied and when called to the stand, was asked by the judge, "Do you realize you are here under court order?" "Yes, Your Honor." "And, you do realize you are to testify

completely on the documents you have been ordered to bring to court?" "Yes, Your Honor." "Very well, please swear the witness."

Testimony was given as ordered on the exemplars supplied by Attorney B only. The testimony was against the assertions of the client of Attorney A, who originally retained the examiner. During testimony it was possible to state this was an unusual situation, and that it was most uncomfortable for the examiner to have to testify in this manner.

After the examiner left the stand, Attorney B rested his case. The judge then declared a ten minute recess, stating that "Since the examiner explains it is uncomfortable having to testify in this manner, it is advisable that the court once again read Rule 26."

Returning to the bench later, the judge declared, "Rule 26 is there to protect the integrity of expert witnesses, and there is full understanding of the examiner's position in this matter, therefore, said testimony is thrown out. However, Attorney B, the ruling is in your favor anyway because you have successfully proven the Defendant's integrity was questionable in other ways and there is no need for the testimony of this expert witness."

The examiner was excused, and the next morning both Attorneys A and B called to thank the examiner for her professionalism.

Jane Eakes has been self employed and a business owner for over 45 years. A good portion of her career has been spent detecting and setting up procedures to prevent employee theft. She branched out into the Questioned Document Examination field and has been court qualified as a document examiner for 15 years. Ms. Eakes has testified in Criminal, Circuit, Chancery, Probate and General Sessions Courts in various counties in Tennessee, and has testified for the FBI in US District Court in Georgia.

EXPERT NOTES**MOTION IN LIMINE PRECLUDES
EXPERTS' TESTIMONY**

by

Kay Micklitz, CDE

In a federal case, a request was made for a court-appointed document examiner for the defendant. An examination and analysis of the evidence resulted in a finding that was not favorable for the defendant and a verbal report was made to the court-appointed defense attorney.

Subsequently, preparing for trial, the prosecuting attorney advised the court-appointed defense attorney that he intended to subpoena the expert witness for testimony at trial. The defense attorney argued with the prosecutor that the examiner was appointed to assist the defense and that the expert became an agent for the defense. Further, that the attorney work-product doctrine extends to the expert advisor of the defense and shelters the mental processes created in anticipation of litigation. Arguing further, the attorney cited the defendant's right of confrontation as prosecution could block the defense attorney's attack by having prior disclosure of defense expert's findings.

In citing equal protection and due process, the defense counsel referred to the Court's appointment of an expert as a means to provide technical assistance and to help evaluate the strength of the defendant's case and to offer his own expert opinion at trial, if favorable. Also, that the expert was appointed to assist the trier-of-facts as to any weaknesses in the prosecution's case either by testifying himself and/or preparing counsel to cross-examine opposing experts.

Defense counsel then prepared and filed with the court the Defense Motions to Invoke Attorney Work-Product Doctrine and Motion in Limine on

Conclusions of Defense Expert. Based on different reasoning, defense counsel filed a Motion in Limine to Exclude Testimony of [Prosecution's] Questioned Documents Examiner.

The defense attorney was successful in precluding both experts' testimony against his client.

The Motions filed with the court are presented herein with the author's notes regarding cites referenced in the motion to exclude prosecution's expert's testimony.

Kay Micklitz, CDE, is a board certified document examiner. She holds a Paralegal certificate from the University of Texas, San Antonio and has an extensive background in civil litigation. Kay joined NADE in 1995 and earned her CDE in 1997. She completed studies through the National Questioned Document Association, and the American Institute of Applied Science for Questioned Documents and Police Photography. Kay is a certified instructor for the Texas police officers and private investigators. She is court qualified, and has been appointed by both state and county courts to examine documents.

**UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
SAN ANTONIO DIVISION**

UNITED STATES

V

SA-98-CR-[DEFENDANT]

**DEFENSE MOTION TO
INVOKE ATTORNEY
WORK-PRODUCT DOCTRINE
AND MOTION IN LIMINE
ON CONCLUSIONS OF
DEFENSE EXPERT**

TO THE HONORABLE [JUDGE], UNITED
STATES DISTRICT JUDGE:

Defendant [Name] objects to prosecution efforts to have [Expert], a defense questioned documents examiner expert and agent to testify for the prosecu-

tion. Defendant sets forth the following factual basis and legal basis for this motion.

FACTUAL BASIS

Defendant [Name] provided handwriting exemplars to both the FBI and [Expert] prior to the Court's appointment of [Defense counsel] as defendant's attorney. The defense provided these exemplars to the prosecution under this Court's reciprocal discovery order.

After the Court appointed counsel, the attorney filed an *ex parte* motion for the Court to appoint [Expert], a questioned document forensic examiner, "under 18 U.S.C. §3006(3) to assist the defense to prepare its case." This Court granted the motion. [Expert] thereafter examined documents and exemplars in the possession of the FBI, including the reports of two FBI questioned document examiners.

[Expert] prepared no report; thus, there was no report to produce to the prosecution under reciprocal discovery.

The defense will not call [Expert] at trial to testify. Nonetheless the prosecution has hinted it may compel [Expert] to testify at trial as its witness.

LEGAL BASIS

Defendant objects to prosecution efforts to have [Expert] testify for the prosecution on the following grounds:

(1) Violation of Attorney Work-Product Doctrine. Such testimony is privileged under the attorney work-product doctrine and inadmissible under Fed.R.Evid.501.

The examiner was appointed to assist the defense under 18 U.S.C. §3006(3)(1). This advisor became an agent for the defense under Fed.R.Crim.P. 16(b)(2). The attorney work-product doctrine extends to the agent advisor of the defense and shelters [her/his] mental processes created in anticipation of the [Defendant] litigation. United States v.

Nobles, 422 U.S. 225, 238-39 (1975) ("At its core, the work-product doctrine shelters the mental processes of the attorney, providing a privileged area within which he can analyze and prepare his client's case. But the doctrine is an intensely practical one, grounded in the realities of litigation in our adversary system. One of those realities is that attorneys often must rely on the assistance of investigators and other agents in the compilation of materials in preparation for trial. It is therefore necessary that the doctrine protect material prepared by agents for the attorney as well as those prepared by the attorney himself. Moreover, the concerns reflected in the work product do not disappear once trial has begun. Disclosure of an attorney's efforts at trial, as surely as disclosure during pretrial discovery, could disrupt the order, development and presentation of the case.") (Note 13: "The sole issue in *Hickman v. Taylor*, 329 U.S.495 (1947)] related to materials prepared by an attorney, and the courts thereafter disagreed over whether the doctrine applied as well to materials prepared on his behalf ... Necessarily it must. This view is reflected in ... Rule 16 of the Criminal Rules....").

To have it otherwise would not only violate the work product doctrine but it also would violate the accused's constitutional rights. Defendant moves to preclude the prosecution's calling the defense expert agent on the following additional grounds:

(2) Violation of Constitutional Rights. Defense further objects to such testimony as it would violate the following of Defendant's Constitutional rights:

(A) Effective Assistance of Counsel. Compelling the defense expert agent to testify would deny defendant effective assistance of counsel under the Sixth Amendment of the Constitution of the United States. Detailing defense expert's conclusions of the strengths and weakness of the handwriting analysis would impair the effectiveness of defense counsel's cross-examination of prosecution witnesses, his strategy, and his tactics.

(B) Right of Confrontation. If the attorney's strategy was thus impaired with disclosure, the prosecution could block the defense attorney's attack through witness preparation, and thus violate the accused's right to confront the witnesses against him in violation of the Sixth Amendment of the Constitution of the United States.

(C) Equal Protection & Due Process. Where a defense advisory expert is appointed for an impecunious defendant under Fed.R.Crim.P. 16, and *Ake v. Oklahoma*, 470 U.S. 68 (1985), a violation of the work-product doctrine would violate the equal protection component of the Fifth Amendment Due Process Clause of the Constitution of the United States. See generally *DeFreece v. State*, 848 S.W.2d 150, 159 (Tex.Crim.App. 1993) [Due process] means the appointment of [an expert] to provide technical assistance to the accused, to help evaluate the strength of his defense, to offer his own expert [opinion] at trial if it is favorable to that defense, and to identify the weaknesses in the State's case, if any, by testifying himself and/or preparing counsel to cross-examine opposing experts.").

WHEREFORE, Defendant prays that this Honorable Court sustain this motion in limine to preclude the prosecution from having the defendant's expert agent [Expert] from testifying as to [her/his] observations, conclusions, and opinions of questioned documents and writing.

Respectfully submitted,

* Note: The United States answered the motion stating that it did not intend to call the court-appointed defense questioned document examiner expert, but believed that it could do so under the authority of *United States v. Pipkins*, 528 F.2d 559 (5th Cir. 1976). *Pipkins* objected only on the grounds of attorney-client privilege, not on attorney work product or other constitutional protections. *Pipkins* never mentions the U.S. Supreme Court's decision in *Nobles*. Not raised by the prosecution but in existence is *United States v. Milano*, 443, F.2d 1033

(10th Cir. 1971), *cert. denied*, 404 U.S. 943 (1971). Here defendant's handwriting expert concluded that defendant wrote the questioned writings but did not testify for the defendant. However, the defendant testified and denied authorship of the writings. The court then allowed the prosecution to call the defense expert in questioned documents to testify that defendant wrote the questioned writing. *Milano* was decided before the Supreme Court decision in *Nobles*.

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
SAN ANTONIO DIVISION

UNITED STATES
V.
SA-98-CR-[DEFENDANT]

**MOTION IN LIMINE
TO EXCLUDE TESTIMONY
OF QUESTIONED
DOCUMENTS EXAMINER**

TO THE HONORABLE [JUDGE], UNITED STATES DISTRICT JUDGE:

Defendant [Name] and his counsel move the Court to preclude the testimony of questioned documents examiners.

OBJECTIONS

Defendant [Name] objects to such testimony on the following grounds:

- The area of questioned document examination does not fulfill the criteria of Federal Rule of Evidence 702.
- Such testimony is not relevant in violation of Federal Rule of Evidence 401 and 402.
- If relevant, the testimony would violate Federal Rule of Evidence 403 because of the danger of unfair prejudice and confusion of the issues.
- FBI Examiner [Name] lack the requisite qualifications and training to be a questioned document examiner.

ARGUMENT

1. Questioned Document Examination Not Scientific. Forensic document evidence lacks scientific validity as it is not based on scientific knowledge. United States v Starzecpyzel, 880 F.Supp 1027 (S.D.N.Y. 1995).¹ 2. Questioned Document Examination Does Not Qualify as "Technical or Other Specialized Knowledge". Forensic document examination does not qualify as "Technical or other specialized knowledge" within Fed.R.Evid. 702. "Knowledge" requires more than subjective belief or unsupported speculation. Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, ___, 133 S.Ct. 2786, 2795 (1993). Studies indicate that handwriting analysis may be less trustworthy than polygraph evidence. United States v. Scheffer, 118 S.Ct. 1261, 1277 and n.24(1998) (Stevens, J., dissenting) (polygraph case).

In Starzecpyzel, the Supreme Court of the United States has concluded that Daubert factors should indeed apply to non-scientific expert evidence. Kumho Tire Co., Ltd. V. Carmichael, 119 S.Ct. 1167 (1999). Judge McKenna concluded that document examiner testimony would not be admissible if Daubert factors applied. Starzecpyzel, 880 F.Supp., at 1036. [See footnote above.]

The Daubert factors included testability and known error rate, peer review and publication, and general acceptance. Document examination to detect forgery is inherently untestable. To this, the defense notes that the FBI has established no objective standards for identification, inclusion or exclusion, or error rate.

Because of these significant deficiencies, questioned document evidence is not relevant, as it realistically lacks the ability to make the existence of a fact in issue more probable or less probable.

Even if relevant, such evidence would be inadmissible because the prejudicial effect of asserting an aura of forensic or scientific reliability.

Lastly, [FBI expert] lacks the education, background, and training to be an expert witness in the area of questioned document examination. Her bachelor's and master's degrees in [fields] provide no knowledge basis for examining questioned documents. She has worked primarily as [career] and then only as an analyst in the document section where she "worked in cooperation with a document examiner." She is only a "trainee affiliate" of the American Academy of Forensic Sciences. The bylaws of that Academy defines a "trainee affiliate" as follows:

TRAINEE AFFILIATE: Individuals who have completed their formal education (undergraduate or graduate degree programs) and are in a training program in one of the forensic science disciplines; or individuals who have completed their education and training but who do not meet the experience requirements for Provisional Membership, may become Trainee Affiliates of the Academy. Each Trainee Affiliate shall be subject to an annual eligibility review by section officers. <<http://www.aafs.org/>>

Under the circumstances, the Court should sustain this motion in limine.

Respectfully submitted,

* Note: Defendant pleaded guilty before the motion was litigated.

1 *Review of Court Cases Which Hold Handwriting Examination To Be A Science*, Marcel B. Matley. Research reveals that many cases address the aspects of expert handwriting evidence which are elements of the equivalent of scientific certitude, as well as cases that support the determination that expert handwriting evidence is scientific. Reference to 13 cases supporting handwriting evidence is made in the following article: "Forensic Handwriting Identification: Is It Legally A Science; International Journal of Forensic Document Examiners, April/June, 1997.

CASE NOTES

TWO WOMEN, A HOUSE AND A COURT CASE

by

Sheila R. Lowe

An elderly woman and her daughter died within a short time of each other. The daughter, Paula Galloway, had been the executor of her mother's estate. Now, the job of executor of both estates fell to the son, whereupon he discovered some irregularities, including possible forgeries. When the probate judge who was administering the cases learned that three sets of signatures were being contested by the heirs, he ordered the parties to retain handwriting experts and return at a later date for a hearing.

Concerning one document, the evidence presented by the handwriting expert was clear, and the parties settled before the judge made a ruling. The other part of the case arose with the executor's discovery that a house owned by his mother and sister had been sold in 1989, but that payments were not being made on the loan. In Ms. Galloway's papers was a mortgage agreement signed by Ms. Galloway and the buyer. Since the house had been owned free and clear, the loan was strictly between those two parties.

When the executor (Mrs. Salene's son) contacted the buyer and asked him to bring the loan payments up to date, the buyer produced a photocopied document with alleged signatures of Paula Galloway and her mother, Iola Salene. The document declared that, in the event of their death, the buyer was forgiven the balance of the loan, which at this point amounted to approximately \$225,000. The document, purportedly prepared in 1992, was neither notarized nor witnessed. When asked for the original, the buyer claimed that upon obtaining the signatures forgiving him of

the debt, he had returned the original document to Ms. Galloway. No original of the questioned document was ever found.

The buyer testified that he was not acquainted with Ms. Galloway before the sale of the house and had no dealings with her, other than a buyer/seller relationship. He had driven past the property several times and noted that it was empty, then checked out the ownership and contacted Ms. Galloway with an offer to purchase. Although the executor was not a beneficiary of the will, he and other family members retained a document examiner, stating that they did not want the property to pass into the hands of someone who had no right to it.

Eight exemplars of Iola Salene and thirteen of Paula Galloway, several of which were originals, were made available for comparison. Although the subsequent examination and report included findings on the signatures of both women, the judge rendered his opinion based solely on Ms. Galloway's signature. (Note: One of Ms. Salene's daughters testified under oath that her mother could not have signed the questioned document because, on the date it was purported to have been signed, her mother was traveling in another state.)

Among the exemplars of the two women's signatures were two documents on which the signatures so closely matched the questioned signatures (a Grant Deed signed by Iola Salene, and the Mortgage Agreement, signed by Paula Galloway) that it was the DE's conclusion that the questioned signatures had been placed upon the documents by some means other than the parties having signed them, probably by tracing. The buyer had copies of both documents.

The eight standard signatures of Ms. Salene were written over a period of some thirty years and maintained a high degree of consistency. See Figure 1. Ms. Galloway's signatures were written over a ten-year period, plus a signature on her

Exhibit B
Iola Salene Standards

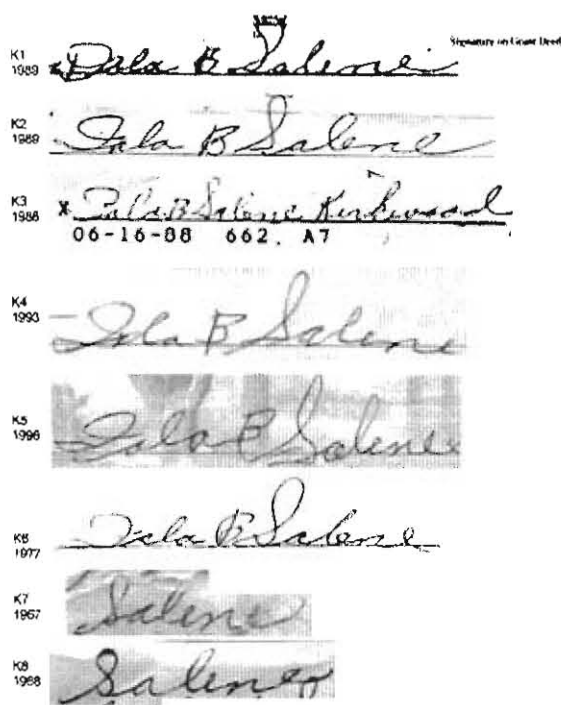


Figure 1

Social Security card, which was undated but known to have been signed more than twenty years prior to her death. See Figure 2. Ms. Galloway's range of variation was greater than that of her mother, but nonetheless contained a fairly high degree of consistency within that range. Additional information provided was that both women were alcoholic and Ms. Salene was diabetic, with resultant poor eyesight.

All the signatures were scanned at 600 dpi using a Hewlett Packard 5200C scanner. In Corel Photo Paint 8.0, transparencies were created from the signatures on what have been designated the "copy documents" and overlaid on the questioned signatures. The only discernable differences were the lack of a middle initial in the questioned documents (Iola Salene used a middle initial in all other legal documents she signed), and an extra long final stroke in the name "Paula." in addition, the final stroke on "Galloway" turns downward.

Exhibit C
Paula Galloway Standards



Figure 2

Keeping in mind that the questioned document was a photocopy of a fax of a photocopy, the DE made it clear to the client that the opinion was qualified, pending an examination of the original or a better copy. When presented with a second generation copy in the courtroom by the opposing attorney, and asked whether the better copy changed her opinion, the DE was able to state that it strengthened her position that the signatures were probably traced.

In the questioned signatures that were first examined, a slight tremor appeared at the tops of the capital letters in the first names of both women, which was exaggerated by transmitting them through the fax. Although the tremor was less evident in the second-generation copy of the Salene signature, it was still evident in the Galloway signature under magnification.

As we know, one of the basic premises of document examination is that no one writes his or her name exactly the same way twice. With the exception of the items noted above, the two sets of signatures are far too close to have been made by the same two persons at different times (several years apart). The exhibits presented for purposes of this article (See Figures 3 and 4) indicate by arrows the points of agreement between the questioned signatures and the known signatures designated as the "copy documents." The form of the capital "S" on Salene in the questioned document matches the "copy document" perfectly, but is made differently in all other standards.

If there are differences in the signatures, the document examiner must be able to explain the differences. It is logical to assume that one who has the skill to reproduce another party's signature, either by tracing or some electronic method, would probably recognize the need to make some changes. This can account for the very minor differences in the signatures, which are to the final strokes in the Galloway signature. One of these final strokes fills in the gaps where the middle initial is on the copy document. The only change in

the Salene signature is the lack of the middle initial. In both sets of signatures, when overlaying the copy document on the questioned document, one name at a time (with the exception of the added final strokes), the signatures are identical.

Unfortunately for the Salene/Galloway family the judge did not agree. The buyer was awarded the house, free and clear.

Sheila Lowe has been active in the field of handwriting since 1967. She has been a court-appointed handwriting expert and her testimony has been accepted in the California Superior Court system since 1985. Her experience includes work with corporate clients, the media, mental health professionals, police departments (U.S. and Australia), offices of the Public Defender, attorneys, and private investigators. She is a member of NADE and has lectured on handwriting at the annual conference of NADE, American College of Forensic Examiners, American Handwriting Analysis Foundation, American Association of Handwriting Analysts, and others.

Your comments are welcomed:
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Exhibit D



Figure 3

Exhibit E

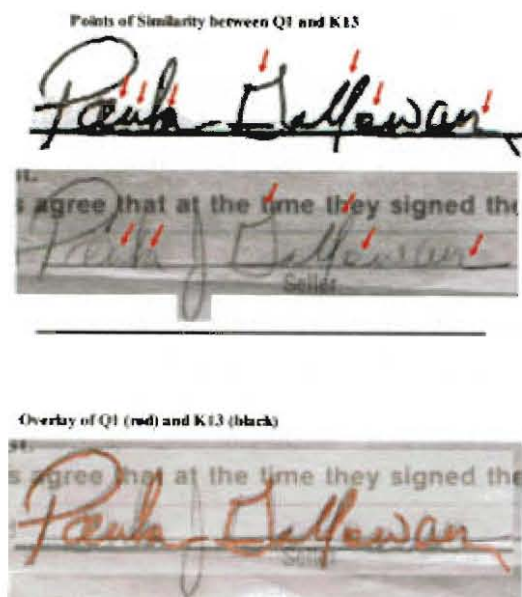


Figure 4

FORENSICALLY SPEAKING

By

Phil Cook, CDE

* The Latin phrase "obiter dictum" ("said in passing") describes an incidental statement, a passing remark, or an opinion uttered as an aside. It is often used to refer to a judge's opinion that is not binding.

* Because of the *Daubert v. Merrill Dow* (1993) and *Kumho Tire v. Carmichael* (1999) decisions, expert testimony will be scrutinized by federal judges. This refers to technical as well as scientific experts. Some may wonder if this were not always the case; however, now the judges' rulings on the admissibility of hearing experts' testimonies will no longer be reversed unless there is an "abuse of discretion." ExpertPages.com has an article on this subject in its Spring 1999 Newsletter edition, and feels that abuse of discretion is a very difficult legal standard to meet.

* The United States Secret Service is the oldest general law enforcement agency in the Federal Government. It was created in 1865 to suppress counterfeiting, which, at that time, accounted for one-third of all money in circulation. Since then other duties have been added to the Secret Service jurisdiction such as apprehending forgers of government checks, bonds and securities, although its chief job is to protect United States' presidents.

* Pre-trial sessions between forensic document examiners and attorneys, while mutually beneficial, are usually more helpful to the attorneys. The reason is that there are so many attorneys who have never used a handwriting expert or have limited experience with them. During the pre-trial conference, the expert should enlighten the attorney by providing a list of qualifying questions that may be used, at the attorney's discretion, during voir dire.

* The ancient Greeks and Romans wrote on papyrus. Paper was invented by the Chinese, around 100 AD, (Ts'ai-Lun being the world's first papermaker in the empire) and the process was kept a virtual secret for 600 years until warring Arabs captured Chinese paper makers and discovered it. The Arabs then kept the process a secret until the twelfth century when it started spreading to other areas of the world.

* Have you ever wished you had a digital highlighter that would transfer what you were highlighting directly to your computer? You might be interested in the QuickLink Pen. Information is available at <http://wizcomtech.com>, or by calling 888-777-0552.

* Need to remove a label, sticker or piece of tape? You could experiment with "Un-Du" which is available at most office supply stores.

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